tion of the Paris Academy it was decided to assume control of the committee of physiology, having for its object the standardisation of the self-recording instruments used in physiology and increased uniformity in the methods used in that science.

M. Darboux concludes his article by mentioning a matter which proves at least the interest excited by the formation of the International Association of Academies, namely, that intended donations have already been announced. At the suggestion of M. Diels, it has been decided that any one having expressed the desire to give to the Association the means to develop its action could make the donation, with special instructions, to any of the academies taking part in it. Other less determinate projects will come before the general meeting. One, from the Academy of Munich, has reference to the publication of a "Corpus des actes et diplômes grecs du moyen âge et des temps postérieurs."

Another, suggested by the Academies of Leipzig, Munich and Vienna, is the publication of a "Real-Encyclopædie des Islam."

The committee meeting at Paris had finally to fix the date of the next meeting, the first general meeting. It is to be supposed that some, at least, of the proposals here made known demand careful consideration; hence, to leave the academies which have presented them time to give them a precise and definite form, Tuesday, April 16, which follows Easter Tuesday, 1901, has been fixed as the date of the next general meeting of the Association at Paris.

The various discussions and proposals mentioned are, without doubt, of unequal importance; they have at least the merit of being very varied and of putting in evidence the diversity of the services that may be rendered by the International Association of Academies.

The Association has been received with favour wherever science is cultivated. "Already," remarks M. Darboux, "we look to it for many works which it alone will be capable of realising. It may be recalled that the agreement between scientific men in the field of theoretical research often precedes a good understanding between peoples in the field of practice and business. There is a feeling that a new organism has been created, which should ultimately be called upon to exert a great and beneficent influence. It is important that the constituent academies should justify this feeling and forward the working of the Association by submitting carefully thought out proposals. It is important, also, that all those who expect much from the Association should bear in mind that it has time before it; that, by their very nature, academies are bodies which move with a certain slowness; and that time ought to be given to the new Association to create little by little the means by which it may be able to realise all the hopes to which it has given rise."

PROF. C. F. LÜTKEN.

CHRISTIAN FREDERIK LÜTKEN was born on October 7, 1837, at Sorö, a small town in Zealand, which at that time possessed an academy where his father was professor of philosophy. When quite a young man, even before his student days, his interest in the natural sciences was awakened, and after his examinations were completed he devoted himself heart and soul to zoology. In 1848 his studies were interrupted by the war between Germany and Denmark, in which he enlisted and served as a lieutenant. In 1852 he left the army and obtained his master's degree with distinction, almost immediately after which he was appointed assistant to Prof. Steenstrup, at Copenhagen, whose pupil he had been in his early days at Sorö. Thus began a connection with the zoological museum of the University which lasted for 47 years, terminating only when illness enforced his resignation.

His career was marked by constant devotion to the collections under his charge, and by the publication of a long series of scientific memoirs, published chiefly in the *Transactions* (Skrifter) and *Proceedings* (Oversigt over de Forhandlinger) of the Royal Danish Academy of Sciences, and the *Communications* (Videnskabeliger Meddelelser) of the Natural History Society of Copenhagen. His studies were always intimately connected with his work in the museum, and hence systematic zoology and geographical distribution and, to some extent also, palæontology constituted the main subject of his writings. Almost every one of the larger divisions of the animal kingdom owes something to Lütken's industry, but during his earlier years he concentrated his attention principally on the echinoderms, and later on ichthyology. Under the title "Dyreriget" he published a small text-book of zoology, a work which would have attracted considerable attention had it been in a language more generally understood. It is still the authorised text-book in most of the educational establishments in Denmark. Amongst his scientific writings special attention may be called to three papers on the echinodermata of Greenland and on the geographical and the bathymetrical distribution of northern echinodermata, which constituted the thesis for his doctor's degree; to a memoir entitled "Spolia Atlantica," which gives a large series of important observations on the young stages of many species of fish, and to a communication on *Himantolophus reinhardti*, a deep-sea lophioid fish, in which he first called attention to the probability that the attracting tentacles in these forms are phosphorescent.

On the death of Prof. Reinhardt, in 1883, he was appointed "inspector" of the department of vertebrates, and in 1885 he succeeded Steenstrup as professor of zoology and director of the museum. As a professor he was by no means the conventional pedagogue, and his pupils obtained from his lectures a clear and striking picture of the animal kingdom. Physical weakness, however, gradually grew upon him, and in his later years it was only with difficulty that he accomplished any teaching at all, and his auditors were frequently anxious lest he should be unable to complete his lecture, so feeble and distressing was his appearance. In 1897 he resigned the chair, and for the last year of his life was a victim of paralysis, which completely disabled him. He died on February 6, 1901, leaving behind him a record of valuable services to the University and to the science which he loved, and the memory of an intellectual and genial personality in the minds and hearts of all who had the privilege of his personal acquaintance. W. E. H.

NOTES.

Reference was made in our issue for February 28 to the retirement of Sir A. Geikie from the office of director-general of the Geological Survey, and to the appointment of Mr. Teall as successor. Mr. Teall takes the title of director of the Geological Survey and Museum, and the further changes in the staff (which date from April 1) are as follows: Mr. H. B. Woodward to be assistant director (for England and Wales), and Mr. John Horne to be assistant director (for Scotland); Mr. C. Fox Strangways, Mr. Clement Reid and Mr. Aubrey Strahan to be district geologists for England and Wales; Mr. B. N. Peach and Mr. W. Gunn to be district geologists for Scotland; and Mr. G. W. Lamplugh to be district geologist for Ireland.

Sir Archibald Geikie will be entertained at a complimentary dinner on May 1, as a mark of recognition of his services to geology, and in commemoration of his recent retirement from the position of director-general of the Geological Survey and director of the Museum of Practical Geology. The dinner will be given at the Victoria Hall, Criterion Restaurant, and the chair will be taken by Lord Avebury. The committee includes many distinguished and representative men of science, among them being Lord Kelvin, Lord Lister, Sir William Huggins, K.C.B., Sir Norman Lockyer, K.C.B., Sir John Murray, K.C.B., Sir Michael Foster, K.C.B., Sir William de W. Abney, K.C.B., Sir William Turner, K.C.B., Sir Henry Howorth, K.C.I.E., and Profs. Judd, Bonney, Le Neve Foster, McKenny Hughes, J. Geikie, Ray Lankester and Lapworth, as well as a number of other Fellows of the Royal Society. Tickets for the dinner can be obtained from the honorary secretary of the committee, Mr. F. W. Rudler, 28, Jermyn Street, S.W.

Prof. Humbert has been elected a member of the section of geometry of the Paris Academy of Sciences, in succession to the late M. Hermite.

The summer meeting of the Anatomical Society of Great Britain and Ireland will be held in the Yorkshire College, Leeds, on Friday and Saturday, July 5 and 6.

We learn from *Science* that Dr. Robert Bell has been appointed director of the Geological Survey of Canada, in succession to the late Dr. G. M. Dawson; and that Dr. S. W. Stratton has been appointed director of the newly-established U.S. National Bureau of Standards, by Mr. McKinley.

The Easter excursion of the Geologists' Association will be to Kingsbridge, Salcombe and district, under the direction of Mr. W. A. E. Ussher and Mr. A. R. Hunt. The members taking part in the excursion will leave Paddington on the morning of Thursday, April 4, and return on the following Tuesday evening.

It is announced from Berlin that the German Emperor has abandoned his original intention of opening in person the forthcoming fifth International Congress of Zoology, which is to be held in the German capital on August 12–16, and that, in consequence of a special desire on the part of the Empress, the German Crown Prince has undertaken to perform this task.

Mr. Vaughan Cornish has returned from an expedition in search of snow-waves in Quebec, Manitoba, the North-West Territories and British Columbia. These waves were found to be well developed on frozen rivers and lakes and on the open prairie, where photographs and measurements were taken. They are produced without the intervention of any obstruction, and sometimes occur in groups or trains of waves comprising a hundred succeeding ridges. Their movement is sufficiently rapid to be readily visible. In certain conditions of the snow true ripples are also formed, which are similar to the ripples produced by wind in loose dry sand. In both ripples and waves the steeper face is on the lee side. In moist or coherent snow, such as usually falls in England, the wind carves the surface into ridges which have their steep face on the windward side.

An outward and visible sign of progress in the arrangements for the British Antarctic expedition which in July or August will set out under the auspices of the Royal Society and the Royal Geographical Society, was shown by the successful launch of the *Discovery*, the ship specially built for the expedition, at Dundee on March 21. Lady Markham christened the vessel, which, when completed, will cost about 50,000*l.*; and at a banquet held after the ceremony Sir Clements Markham referred to the lack of geographical knowledge of Antarctic regions and the opportunities which will be afforded for the study of the great ice barrier. The purely exploratory work of the expedition will, of course, be of interest, and as that appeals to the public mind it is perhaps expedient to give prominence to it. But the necessity for the expedition lies in the absence of information concerning the natural history, physics and meteorology of the south polar regions, and it is with the provision made for the investigation of these subjects that men of science are most concerned. We are glad, therefore, to know that the scientific work of the expedition is in the hands of Prof. Gregory.

In the House of Commons on Friday, Sir J. Rankin asked the President of the Board of Agriculture whether he would consider the desirability of establishing pomological stations in convenient parts of the country for the purpose of making experiments in the growth of the apple and pear, so as to enable persons employed in the fruit industry to obtain trustworthy information. In reply, Mr. Hanbury said: "Stations for agricultural and horticultural experiments have not hitherto been established directly by the State itself, and in the case of apples and pears, which depend so much upon the climate in which they are grown, no one central station would be of much use, and it is only by local agency that experiment stations could be established in so many varying districts. Both in the North and South of England there are institutions, aided either by the local taxation grants or by direct grants from the Board of Agriculture, in which experiments are made in the growth of pears and apples, and this appears to be the proper system to be adopted in those districts, such as Herefordshire, where there is a special interest in the growth of these fruits."

An account of the work of M. Théodore Moutard, the mathematician, whose death was recorded last week in these columns, is given by M. G. Darboux in the *Comptes rendus.* After leaving the École Polytechnique, Moutard for a long time devoted himself to private teaching, preferring this course to serving under the Government, and he soon established for himself a unique reputation. But in 1870 he returned to the School of Mines, and he rendered valuable services as Inspector-General of Mines. The second part of his career was thus spent in the midst of a circle of congenial and distinguished colleagues. Moutard rarely published papers, but what he did write was of great value. To him we are indebted for the theory of anallagmatic surfaces, and especially of those of the fourth order or *general cyclides*, and Moutard's theory has formed the basis of numerous developments by Laguerre, Rebacour, Mannheim and Humbert. In the theory of partial differential equations of the second order, with two independent variables, Moutard gave a complete solution of an important problem. His manuscript, presented to the Academy, was burnt by the Communists at Bertrand's house; but Moutard re-wrote the most important portions, and the remainder of the theory was re-established by Cosserat. Moutard also wrote some valuable notes to Poncelet's *Applications d'Analyse et de Géometrie*, and his use of elliptic functions in connection with Poncelet's theorems on inscribed and circumscribed polygons has been characterised by Halphen as one of the best and most profound writings on this interesting subject. Moutard sought no distinctions, and never became a candidate for membership of the Paris Academy, although the section of geometry of that body recognised his merits by awarding him the Petit d'Ormoy prize, the highest honour that could be conferred on him. He kept a great many of his writings unpublished, although repeatedly urged to allow them to be printed.

It is with much regret that we record the death, on March 7, of Mr. Arthur Coppen Jones, known to the scientific world as the translator of Fischer's "Lectures on Bacteria," and by an important paper, published in the *Centralblatt f. Bacteriologie und Parasitenkunde* in 1895, in which he sought to establish the revolutionary discovery that the tubercle bacillus is probably no bacillus at all, but a stage in some hyphomycetous fungus. Mr. Jones was one of the last set of students who worked under

Huxley at the Royal College of Science, and he there distinguished himself by taking the Forbes medal. Full of enthusiasm, he laid his plans to return to the College in the following session for the work of investigation, but an exceptionally severe constitutional breakdown prevented him from so doing. He was ordered to Davos, and he there spent the rest of his life, with the exception of brief periods of absence passed in study at the Universities of Zurich and Berlin, he being attracted to the latter city by the now famous investigations of Koch. While at Davos, Jones developed a practice as a consulting bacteriologist, working and experimenting whenever he was able. He did not hesitate to submit even his own person to experiment, and in one of his letters he admitted himself enamoured of the Richet muscle-plasma treatment, with which he experienced an immediate success. In the closing year of his life, Jones returned to some experiments he had previously made upon the physiological effects of air at high altitudes, but to no purpose, for the end came suddenly and peacefully, a tubercular cystic trouble necessitating an operation, which, while affording relief, proved of no permanent value. He was buried at Davos, where his loss will be severely felt.

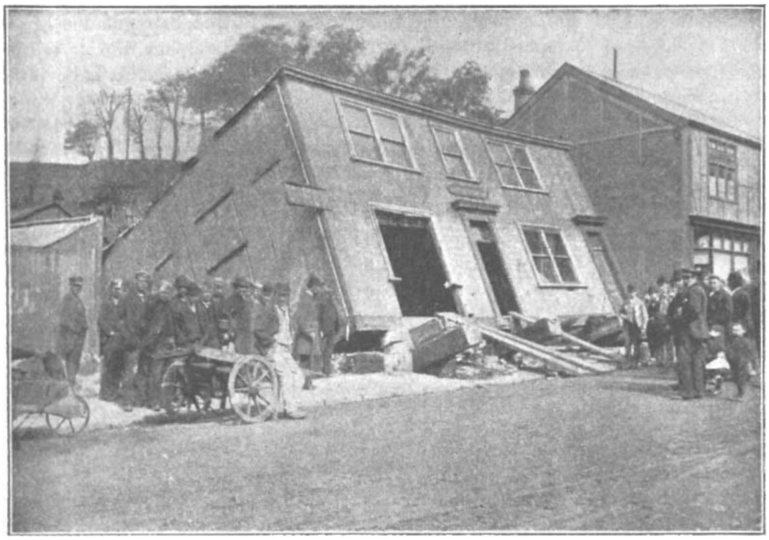
WE have received a pamphlet setting forth in concise form a history of the progress and present status of the work of the Concilium Bibliographicum at Zürich, which for the past five or six years has been maintained at considerable pecuniary risk by Dr. H. H. Field, who in successive periods has had to face a deficit ranging from 5625 francs for each of the first three years to 224 for the last. The official foundation of the institution was by a vote of the third International Congress of Zoologists, at their meeting in Holland of 1895, and the experimental stage of its work has now passed. The Swiss Society of Naturalists, who have all along been among the foremost supporters of the undertaking, have with commendable enthusiasm induced the Swiss Government, by a recent vote of its Parliament, to increase five-fold a subsidy with which during recent years it has generously endowed the work. There is hereby insured the future permanence of the enterprise, which now becomes independent of the person of its present director. The pamphlet gives, in addition, an analytical table of the cards and other bibliographic materials which have emanated from the Bureau, and a register of the distribution of the cards in the chief divisions of the bibliography. Terms of subscription, an outline scheme for future development, with an ambitious programme for the present year, bring the pamphlet to a close, except for the remark that a removal has recently been made to more spacious quarters. Acknowledgment is made of support received from the Elizabeth Thompson Science Fund, and while we would congratulate Dr. Field upon this and the encouraging circumstances under which he starts work for the new century and wish him every success, we would recommend to the consideration of zoologists and bibliographers at home the fact that Cape Colony takes about as many cards as the whole of England. This is a condition which simply should not be, and denotes a poor return for the services done.

THE April Pilot Chart for the North Atlantic and Mediterranean has just been published by the Meteorological Council. It follows the same arrangement as that for the January specimen chart described in our last number. But of course there are, in all directions, important changes in the details. There are some interesting features connected with the winds and currents, particularly the modifications in the set of the currents off our western and south-western coasts, which are, no doubt, due to the prevalence of polar winds off the coasts of north-western Europe in the spring months, causing a surface drift to the westward and south-westward, and interfering with the normal flow of the Gulf Stream. Many subjects are dealt with in the letterpress, but prominence is given to fog and ice about the banks of Newfoundland, these dangers increasing with the opening of navigation of the St. Lawrence Gulf and River for the summer. It is explained that the fogs of this locality have certain peculiarities, the knowledge of which may be of no little service to the seaman. Thus, with the wind blowing from the sea towards the land, the fog is generally of no great density, for objects can often be sighted at a distance of half a mile, but with calm fogs following strong winds nothing can be seen at fifty yards from the deck, yet at a height of fifty or sixty feet in the rigging it may be possible, at the same time, to see almost any distance round. Up to the time of going to press no ice had been reported on the Grand Banks this season, the weather off St. John's, Newfoundland, on the 8th inst. being favourable, and no ice to be seen, so that it does not look like a great ice year.

FOR several years past the Deutsche Seewarte, Hamburg, has made strenuous efforts to accelerate and improve the service of telegraphic weather reports. The subject has been discussed both at international meetings and at conferences of the heads of the German meteorological systems, and it is recognised on all sides that the present service can be materially improved by a more speedy collection, discussion and publication of observations. So long ago as 1872 a very perfect system was introduced in the United States, called the circuit-system, in which the necessary wires over certain telegraph lines are reserved exclusively for the transmission of meteorological messages for a time after each observation. This method has been found to work very satisfactorily in the United States, but in Europe, where the control of the wires is in the hands of various countries, the difficulty of introducing a similar method is insurmountable. The system recommended by the Deutsche Seewarte is called the radial-system, in which the observations pass through the central offices. Special observations have been made for nearly a year at 8 a.m. mid-European time, or at about 7 a.m. Greenwich time, at some thirty-five stations in various countries, including several in the British Islands, and forwarded to the Deutsche Seewarte, which enable the Hamburg office to issue reports as early as 9 a.m.; and the early publication of this information has been found to lead to such satisfactory results as to warrant a considerable extension of the plan in the near future. The method is fully discussed and explained by Dr. van Bebber, in the February number of *Das Wetter*, in an article entitled "The Present Condition of Weather Telegraphy."

WE have received a copy of the year-book of the Austrian Meteorological Office for 1899, containing daily observations at twenty stations, hourly observations for Vienna, and hourly means and monthly and yearly summaries for a large number of stations. During each winter the Vienna thermograms show some anomalous jumps of temperature, amounting to 3° to 5° C. and at times reaching even to 10° in half an hour, or less. The mild winter of 1898–9 exhibited several such cases, and these have been made the subject of an interesting discussion by Mr. Max Margules, who has compared the thermograms of Vienna with those of two places situated some 30 or 40 miles to the east and west of that place. In very sudden rises of temperature it is a matter of considerable importance to know what is taking place above. In all cases it was found that at a relatively greater altitude, say 500 to 800 metres above the lower stations, the warmer temperature occurred some hours or even a day earlier than at the lower stations. The subject has been discussed with reference to the following conditions:—(1) A progressive increase of temperature in the upper air; (2) a constant temperature above; (3) an increasing temperature below with a decreasing temperature in the higher strata of the atmosphere.

THE remarkable subsidences which have often occurred in and around the town of Northwich, in Cheshire, form the subject of a paper by Mr. T. Ward, recently issued by the Institution of Mining Engineers. The subsidences are chiefly due to mining in the Upper Bed of rock-salt, and the too rapid removal of brine by means of modern pumps. In a natural condition the water in or on the salt-beds becomes saturated with salt and then ceases to dissolve it, but now the brine is continually pumped up in immense quantities, and the fresh water which flows to take its place dissolves the salt pillars which have supported the roof and overlying strata, with the result that there is a depression towards each pumping centre. In almost every case the mines in the Upper Bed of rock-salt are destroyed by water rapidly eroding the salt pillars in this way. Another cause of subsidence is the pumping of brine from off the rock-head, that is, the surface of the Upper Bed of rock-salt. These are by far the most serious and widespread, and it is from them that the town of Northwich suffers so much damage. Owing to the subsidences, which show themselves first by small cracks in the buildings, and in doors and windows refusing to shut, a system of framework buildings has been allowed, so that when a building sinks it can be lifted by screw-jacks and put back to its original position. By degrees the town is becoming one of framework buildings, and will, for England, be unique in this respect. The accompanying illustration, which we are enabled to give from Mr. Ward's paper, shows a subsiding house in a street at Northwich.



WE learn from the *Scientific American* that Mr. Edison has recently taken out a patent for a method of obtaining permanent phonographic records. The wax cylinder on which the impressions due to the speech have been made in the usual way is first coated with an extremely thin layer of gold; this is effected by revolving the cylinder in a vacuum between two gold electrodes between which a vacuum discharge is passing. This thin layer of gold is backed up with copper by electro-deposition and the wax is removed, we imagine by melting it off. Upon the copper matrix thus obtained a deposit of silver is thrown down electrolytically, and when this is of sufficient thickness the copper is dissolved off. The remaining silver deposit will retain the thin layer of gold and will be an exact reproduction of the original wax record, but one much more capable of standing repeated use. The value of the invention depends obviously on the fidelity with which the final silver record reproduces the original sounds; if the reproduction is accurate the process is a very useful one, since a phonographic record which is at once faithful and permanent should be of considerable value for historical purposes.

IN the February number of the *Victorian Naturalist* Mr. A. J. North continues his observations on the geographical distribution of Australian birds.

A RECENT issue of the *Bulletin* of the Illinois State Laboratory of Natural History (vol. v. art. 12) deals with the local fauna of leeches (Hirudinea), of which several new forms are described. The occurrence of certain European species is especially noteworthy. Several beautiful plates illustrate the morphology of some of the more remarkable types.

IN its Report for the past year the Oxfordshire Natural History Society and Field Club sets an excellent example to associations of a similar nature by the publication of the first instalment of a local fauna. The group dealt with on the present occasion is the Hymenoptera Aculeata, comprising ants, wasps and bees. The local list is also issued in a separate form, printed only on one side of the paper for cutting up to label collections.

DR. L. STEJNEGER sends us a copy of a paper on the North American wheatears (*P. U.S. Mus.* xxiii. p. 473), in which it is shown that a race of these birds habitually breed in North America. From the differentiation of this Greenland race the author thinks we are justified in inferring that the Greenland-Iceland-England line of migration must be considerably older than the Alaska-Tchuktchi-Udski route, since it has resulted in the establishment of the local variety of the wheatear forming the subject of this communication.

TWO papers in the March issue of the *Quarterly Journal of Microscopical Science* record important advances in our knowledge of the lancelets. In the first Dr. A. Willey describes a new subgeneric type of these primitive chordates from the Orissa coast, under the name of *Branchiostoma* (*Dolichorhynchus*) *indicus*. The distinctive characteristic is the anterior prolongation of the notochord and head-fin; so that this form is exactly the opposite of *Heteropleuron* (*Asymmetron*) *lucayanum*, in which these parts are extended in the other direction. In the second communication Prof. W. B. Benham describes the New Zealand lancelet as *Heteropleuron hectori*. It may be mentioned that, according to modern ideas of nomenclature, the name of the first subgenus of the typical group should be Branchiostoma, and not Amphioxus, which is a synonym.

To the same journal Mr. R. I. Pocock contributes an important memoir on the Scottish Silurian scorpion, with a figure of the specimen discovered in Lanarkshire in 1883. This the author makes the type of a new species, *Palaeophonus hunteri*. As the result of his investigations, Mr. Pocock concludes that Palæophonus apparently occupies a position intermediate between the king-crabs (Limulus) and the Palæozoic Eurypterids, on the one hand, and modern scorpions on the other, although, if anything, rather nearer the former than the latter. The Scotch species thus supplies a few more links to the chain of evidence connecting the line of descent of the modern terrestrial scorpions from marine ancestors more allied to the king-crabs.

WE have the pleasure of congratulating Mr. T. Southwell, of Norwich, on the appearance, in the February number of the *Zoologist*, of the twentieth annual issue of his valuable "Notes on the Seal and Whale Fishery." The season's catch included 16 whales, 494 walruses, 53 seals and 145 bears, which yielded 230 tuns of oil and 219 cwt. of whalebone; in addition to which was the product of 1 whale, 138 walruses and 3400 seals, equal to 60 tuns of oil and 10 cwt. of "bone" from the Cumberland Gulf station. With oil at 22*l.* per tun, and sizable "bone" at 1400*l.* per ton, the estimated value of the take would be about 30,000*l.*, as against 38,000*l.* in 1899. Owing to the bays in which they are usually beached being blocked with ice, no white whales were taken. Mr. Southwell is informed that the Greenland seas are not to be visited by any British whalers during the coming season. Commenting on the practical disappearance of the right whale from the Greenland seas, the author doubts whether this can be attributed to extermination, but is at a loss to determine where the remnant have gone. "As to the seals, the case is much more simple; the destruction year after year of a very large proportion, often virtually of the whole brood and of a large number of old seals in addition, congregated in a limited area, must inevitably tell in course of time, and sooner or later reduce the breeding pack to such an extent that they would be no longer worth pursuing, and even lead to their final extermination. This has doubtless, to a very large extent, been the case. The British vessels have quite abandoned the pursuit, and what there is left of the Greenland sealing is now quite in the hands of the Scandinavians, whose more economical outfits enable them to continue the struggle long after we have been driven from the field."

A BULKY volume just issued by the Government of India contains accounts of the trade carried by rail and river in India in the official year 1899–1900 and the four preceding years, compiled under the direction of the director-general of statistics.

A COLLECTION of tables showing the rainfall recorded on each day of every month from 1868 to 1899 at Dehra Dun has been issued by the Survey of India Department. The daily, monthly and annual means are also given.

THE following lectures will be given at the Royal Victoria Hall, Waterloo Road, during April, on Tuesday evenings:—"Waves and Oscillations," Mr. A. W. Porter; "Wild Nature at Home," Mr. R. Kearton; "Arctic Discovery," Captain Wiggins; "Our Field Crops as a Factory of Food," Mr. J. S. Dymond; "Facts about India: Plague and Famine," Mr. Birdwood.

WE have received a copy of *Kuhlow's German Trade Review and Exporter.* This paper is published in Berlin but is written in English, and contains some interesting translations from German and other technical papers on recent electrical work. The main object of the journal is to introduce German productions to foreign markets, and it is noteworthy as an example of the energy and perseverance with which the Germans are pushing their export trade.

THE *Rendiconto* of the Bologna Academy (iii. 1) contains a paper, by Prof. Ferdinando Paolo Ruffini, on the moments of inertia of a system of points not possessing a mass centre. The author examines, with the aid of certain formulæ already indicated by the late Prof. Beltrami, the disposition in space of the axes which in a given system of points having no mass centre (the sum of the mass constants being zero) have a given moment of inertia. The quadrics which are analogous to the ellipsoids of inertia in an ordinary system are also discussed.

IN a recent number of the *Revue générale des Sciences* Prof. A. Haller describes the contact process of sulphuric acid manufacture as used by the Badische Anilin- und Soda-Fabrik. In this process a mixture of sulphur dioxide and air is brought into contact with platinised asbestos at the proper temperature. The platinised asbestos is placed on perforated trays, supported in an upright tube which is so arranged that it can be heated or cooled by means of a current of air. The temperature at which the best results may be obtained depends upon the concentration of the sulphur dioxide and must be sufficiently high to start the reaction, but lower than the dissociation temperature of sulphur trioxide. A similar process has been in operation for a considerable time in this country and in Germany for preparing "Nordhausen" acid, but it has been found only workable when the mixture of sulphur dioxide and oxygen is pure, such as the mixture obtained from sulphuric acid by dropping it on to hot platinum. Presence of water vapour and other impurities causes the platinised asbestos to become inactive. In the Badische Fabrik process the sulphur dioxide is obtained by burning pyrites, and complete combustion of the sulphur and other oxidisable matter is attained by blowing jets of air and steam into the hot gas just as it issues from the burners. The gas is then washed and dried by passing through sulphuric acid. Before passing into the "contact" apparatus the mixture is examined optically, and must show no trace of cloudiness when viewed through a long tube. It is also chemically examined and must be free from arsenic. By proper regulation of the temperature up to 99 per cent. of the sulphur dioxide is converted into sulphur trioxide. The sulphur trioxide is dissolved in water, and for the production of acid of higher concentration than 60 per cent. the process is more economical than the lead chamber method. The claim is also made that better acid is produced, since it contains no arsenic, nitric compounds or lead.

THE additions to the Zoological Society's Gardens during the past week include a Rhesus Monkey (*Macacus rhesus*) from India, presented by Mrs. F. Page; a Green Monkey (*Cercopithecus callitrichus*) from West Africa, presented by Mrs. Horrell; a Senegal Touracou (*Turacus persa*), a Great-billed Touracou (*Turacus macrorhynchus*) from West Africa, presented by Mr. G. A. Corder; a Goshawk (*Astur palumbarius*), European, presented by Mr. C. Schaible; four Chameleons (*Chamaeleon vulgaris*) from North Africa, presented by Mr. W. F. Cornelius; a Lesser White-nosed Monkey (*Cercopithecus petaurista*) from West Africa, a Grey Ichneumon (*Herpestes griseus*) from India, deposited; a Tasmanian Wolf (*Thylacinus cynocephalus*) from Van Dieman's Land, received in exchange.

OUR ASTRONOMICAL COLUMN.

ASTRONOMICAL OCCURRENCES IN APRIL.

April 1. 15h. 56m. Transit (egress) of Jupiter's Sat. III.
2. 8h. 23m. Minimum of Algol (β Persei).
3. 18h. 0m. Mercury at greatest elongation, 27° 48' West.
4. 11h. 59m. to 13h. 18m. Moon occults B.A.C., 4531 (mag. 5·7).
7. 15h. 59m. to 17h. 19m. Moon occults ω^2 Scorpii (mag. 4·6).
7. 16h. 5m. to 16h. 20m. Moon occults ω^1 Scorpii (mag. 4·1).
15. Saturn. Outer minor axis of outer ring = 15″·96.
15. Venus. Illuminated portion of disc = 0·998.
15. Mars. Illuminated portion of disc = 0·924.
20–21. Epoch of Lyrid meteoric shower (Radiant 270° + 33°).
22. 10h. 5m. Minimum of Algol (β Persei).
22. 10h. 25m. to 11h. 11m. Moon occults χ^2 Orionis (mag. 5·9).
27. 7h. 40m. to 8h. 31m. Moon occults 19 Sextantis (mag. 6·0).
30. 10h. Jupiter stationary.